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In the Claims:

1-23. Cancelled.

24. (Currently Amended) A method of inducing organized, functional bone formation at a site of bone infirmity in a human, comprising the steps of:

(a) transforming a cultured mesenchymal stem cell with a DNA encoding human bone morphogenetic[[sis]] protein 2 (BMP-2);

(b) culturing the cultured mesenchymal stem cell transformed in step (a), under conditions enabling expression of said DNA encoding bone morphogenesis protein 2; and

(c) implanting said cultured mesenchymal stem cell in the absence of an exogenously supplied matrix at a site of bone infirmity,

whereby autocrine and paracrine effects of expressed human bone morphogenetic[[sis]] protein 2 at said site of bone infirmity result in organized, functional bone formation, thereby inducing organized, functional bone formation at a site of bone infirmity.

25 (Previously Presented) The method of claim 24, wherein said mesenchymal stem cell is a primary cell.

26. (Previously Presented) The method of claim 24, wherein said mesenchymal stem cell is a cultured cell line.

27. (Previously Presented) The method of claim 24, wherein said mesenchymal stem cell expresses an endogenous bone morphogenesis protein receptor.

28. (Previously Presented) The method of claim 24, wherein said mesenchymal stem

cell expresses parathyroid hormone and a parathyroid hormone receptor protein.